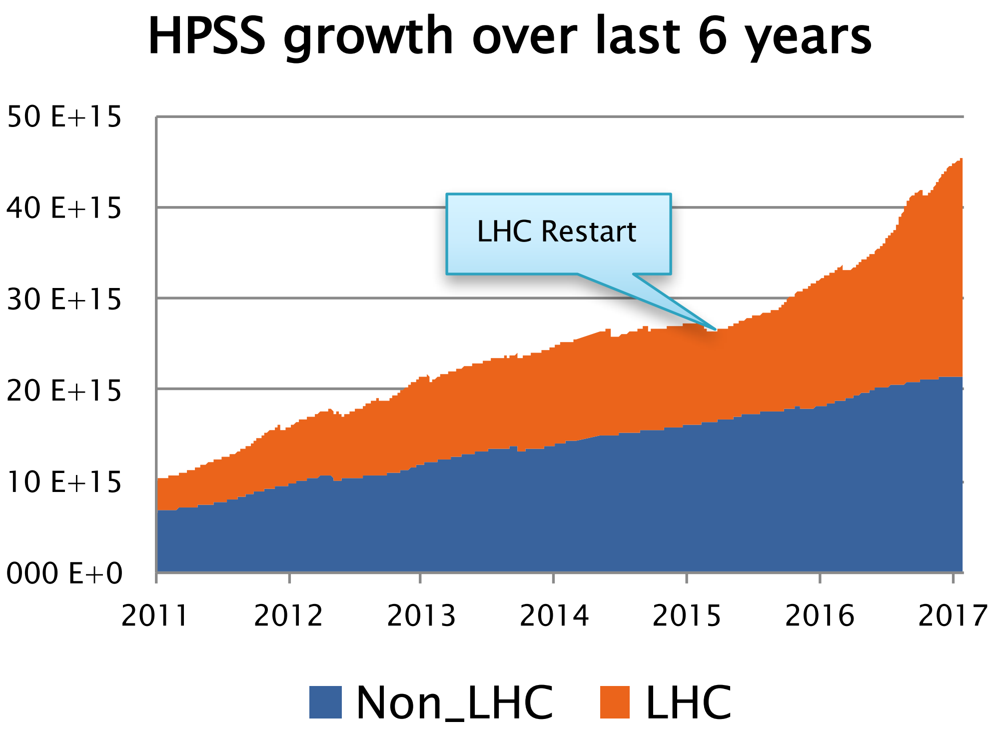
Overview of HPSS at IN2P3

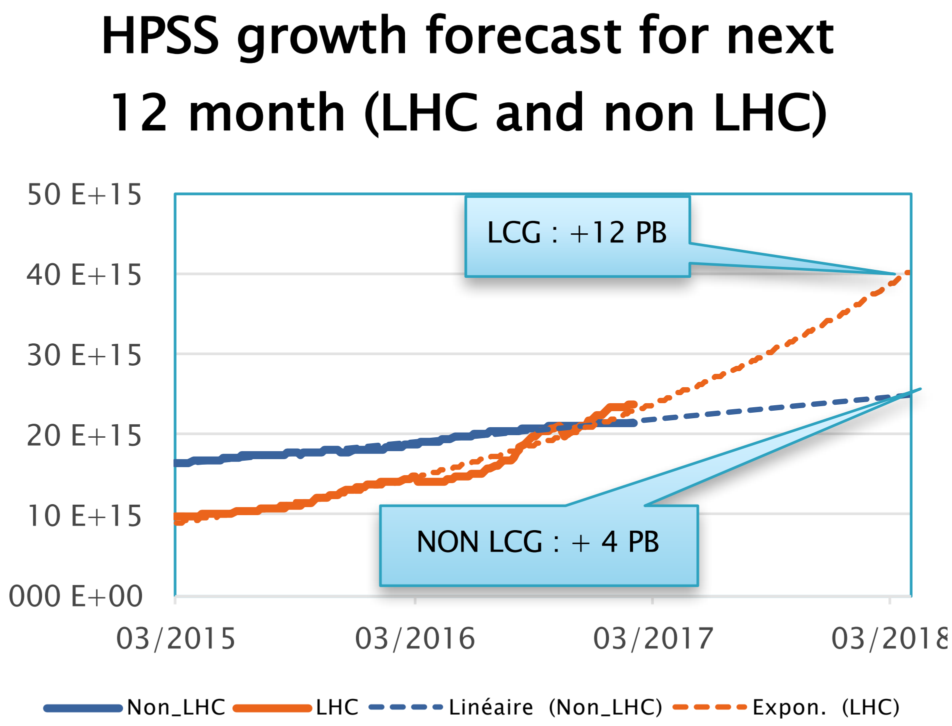
Pierre-Emmanuel Brinette, 2017-02-15

CCIN2P3

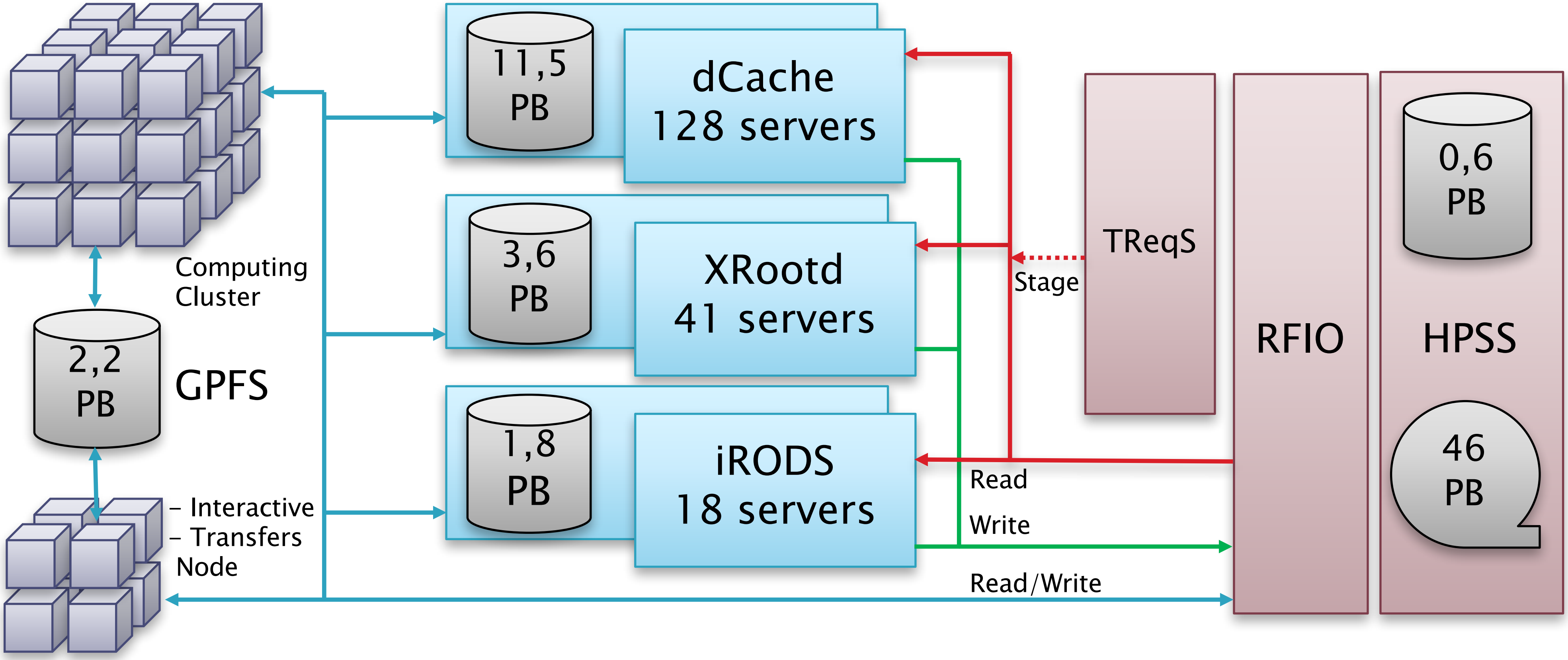
HPSS Overview

- IN2P3 is using HPSS since 1999 for BaBar experiment
- HPSS is the main repository for scientific data
  - 52 % used for LHC data (Alice, Atlas, CMS, LHCb)
- Usage (feb 2017)
  - 46 PB stored, single copy
  - 66 M of files
- Archive expected to grow up to 62 PB within next 12 months (+35 %)





HPSS Overview



- HPSS Interface : RFIO with HPSS extensions
- Historically, direct access from users/jobs to HPSS using RFIO
- Now, 85 % of access are performed through storage middleware
  - dCache (LCG/egee), Xrootd and iRods
  - Reduce stress on robotic due to the large disk cache
- Read operations from storage middleware handled by TReqS
  - Limit numbers of drives used for large reading campaign
  - Optimize files recall by sorting files on the same tape to speedup read
- More details in next presentation

Tape infrastructure

- Tape Libraries
  - 4 Oracle SL8500 Libraries
  - Interconnected (with PTP)
  - Collocated with TSM (backup)
- 140 Tape drives
- 66 Tape drives for HPSS
  - 22 T10K-C (5,5 TB on T10K-T2)
  - 44 T10K-D (8,5 TB on T10K-T2)
  - +12 T10K-D (in 2017)

- 26 000 Tapes
  - 11 000 T10000T1 (to destroy)
  - 8 000 T10000T2 (8,5 TB)
  - 5 000 LTO 4
  - 2 000 LTO 6
- Daily tape mounts:
  - 2 000 average
  - > 10 000 peak
- HPSS Repacks
  - 23,000 T1 → T2 proceed in 2 years
  - T10K-C to T10K-D in progress

Backup Slide : Plans for 2017

- HPSS
  - Migration from HPSS 7.4.2.1 to version HPSS 7.4.3.2 soon
  - Explore HPSS 7.5.x new features
    - Tape Ordered Recall (TOR) to increase TReqS performances
- TAPE
  - Retire T10K-C drives before end of year
    - 1500 Tapes to repack as background activity
  - T10000-E :
    - Will support 12,5 TB on a T10000-T2
    - Not before 2018

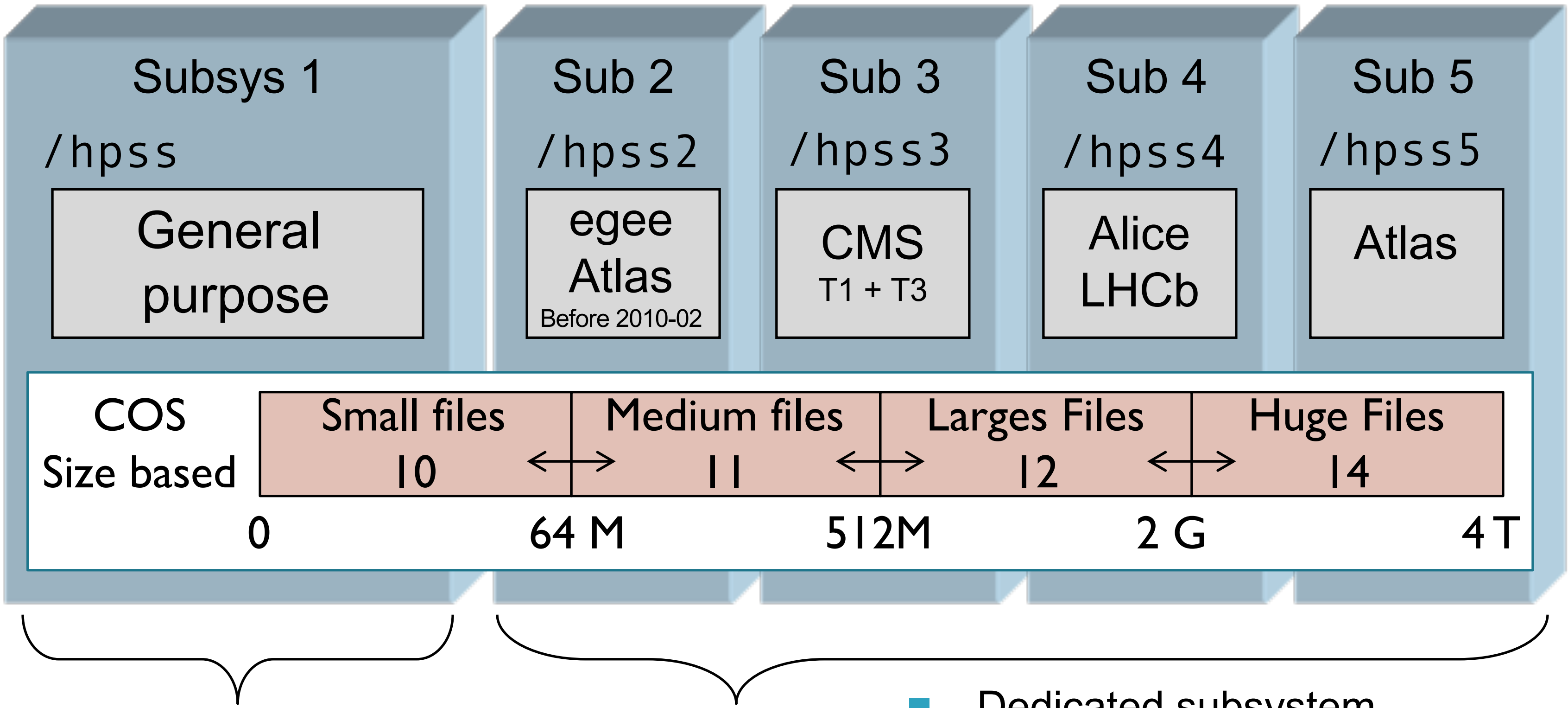
Thank you

Backup Slide : HPSS Hardware refresh

- Hardware refresh not based on a “tender” model but replaced periodically.
  - Use “commodity hardware” for Movers and Core, ie: DELL R720
    - In production for 5 to 7 years, depending the warranty
    - 3 to 6 Movers are replaced every year
  - Tape libraries :
    - SL8500 are still the Oracle “top edge technology”
    - Will be kept in production as long as possible
  - Tapes drives :
    - 6-12 tapes drives are purchased every years
    - Once repacks are finish, old tapes drive technology is discarded
    - In production for 5 to 7 years
  - Tapes :
    - Same tape technology in production for 8-10 years
    - ie : T10000-T1 can be used on 2 drives model (T10K-A and B)
- Repacking tape is a normal background operation

Backup Slide : HPSS Storage policy

- 5 subsystems, 4 COS Only (selected by size), 10th file families
- Different tape resources per COS (ie. Small files on “Sport” tapes)



- Historical
  - 22 PB
  - ~2000 UID
  - 50 M files

- Newly created
  - 24 PB
  - 16 M files
  - Mainly used for LHC Data

- Dedicated subsystem
  - Allow to dedicate DISK resources for specific set of users when using **automatic COS selection**
  - Specific database for a set users → faster query
    - Subsys 1 : 40 GB
    - Subsys [2-5] : 1.5 to 6 GB